ANALYSIS OF

FREQUENCY AVAILABILITY

PREPARED FOR THE

METRO-BOSTON HOMELAND SECURITY REGION

BY

Vogel Consulting Group Inc.

December, 2006

Copyright ©Vogel Consulting Group Inc. 2006
This notice does not imply publication.

Executive Summary

The City of Boston, on behalf of the Metropolitan-Boston Homeland Security Region (MBHSR), is petitioning the Federal Communications Commission under section 337(c) of the Communications Act of 1934, as amended, to use frequencies presently designated Paging and Radiotelephone Service, Subpart E, as channels in the Public Safety Pool under Part 90 of the Commission's rules. Use of these channels by the public safety agencies involved comports with the standards of section 337(c).

Introduction

The U.S. Department of Homeland Security designated Boston a high-threat urban area in July 2003 as part of the Urban Area Security Initiative (UASI) program. As the core city, Boston created the Mayor's Office of Emergency Preparedness (MOEP) to integrate and manage all homeland security activities. The UASI region, the Metro-Boston Homeland Security Region (MBHSR) consists of nine jurisdictions: Boston, Brookline, Cambridge, Chelsea, Everett, Quincy, Revere, Somerville, and Winthrop.

The following 21 organizations form the nucleus of the MBHSR public safety community:

1. Boston Police Department
2. Boston Fire Department
3. Brookline Police Department
4. Cambridge Police Department
5. Cambridge Fire Department
6. Cambridge Public Safety Communication
7. Chelsea Police Department
8. Everett Police Department
9. Revere Fire Department
10. Revere Emergency Management
11. Quincy Emergency Management
12. Somerville Fire Department
13. Somerville Public Safety Communication
14. Winthrop Fire Department
15. Greater Boston Police Council
16. Boston Central Medical Emergency Direction
17. MetroFire
18. Massachusetts Executive Office of Public Safety
19. Massachusetts Port Authority
20. Massachusetts Bay Transportation Authority
21. Boston Mayor's Office of Homeland Security

A number of surrounding Cities and Towns are included in this effort to provide seamless interoperability to other mutual aid responders. They are;

City of Lynn Fire Department
City of Melrose Fire Department
City of Malden Fire Department
City of Medford Fire Department
City of Waltham
Town of Saugus Fire Department
Town of Milton Fire Department
Town of Weymouth Fire Department
Town of Lexington Fire Department
Town of Weston

The plan encompasses the procedures and technology that the MBHSR proposes to use to enhance public safety interoperable communications.

Background

The greater Boston area public safety radio systems evolved independently with limited interoperability and surge capability. As mutual aid agreements became more prominent, region interoperability is of increasing concern. The traditional discipline specific radio systems have become overloaded and are unable to meet the interoperability needs of today's public safety agencies. Individual systems are also experiencing substantial challenges. Regional efforts to make improvements have been hampered by the lack of available frequencies.

Current radio communications for the MBHSR are presently accomplished on predominately UHF with some high band VHF frequencies. These frequencies are shared with many agencies outside the area. MBHSR seeks to construct a public safety unified interoperable radio system to better serve its citizens. It has determined that there is a need for additional two way UHF channels. In addition, there is a need for a number of simplex low power channels for at scene communication.

There are frequencies available within the Boston metropolitan area on TV channels 14 and 16 that are allocated for use in Part 22, section 22.621 of the Paging and Radiotelephone Service. These frequencies are not presently in use by those services and can satisfy the needs of MBHSR. The TV stations on channels 14, and 16 meet the spacing limitations, so use of those frequencies is permitted within the Boston Metropolitan area.

To effectuate this broadened interoperability capability, the Chelsea, Everett and Revere Fire Departments will be moved from their present channels on VHF to UHF. Chelsea will operate on 3 frequencies, Everett and Revere on 2 frequencies each at the

current site locations. In addition, 13 UHF frequencies will be distributed among 10 fire departments that are not part of MBHSR, but have mutual aid responsibilities in the region. The VHF channels of the Chelsea, Everett and Revere Fire Departments will be used to support the wide area interoperability network among all agencies.

The Part 22 UHF paging frequencies will also assist MetroFire. The MetroFire radio system, currently supporting the coordination and operations of 35 agencies in Eastern Massachusetts, will be expanded so that its system is able to support current operational demands. Three frequencies will be placed in a fireground pool for low-power use by all 35 agencies. Four frequencies will be used to implement two vehicle based cross-band repeaters. Six additional frequencies will be used to supplement the repeater fire ground channel with three geographically separated wide area repeater channels. Another 2 frequencies will be designated for arson investigations.

Additionally, six new UHF channels will also be dedicated to assist Boston Emergency Medical Services (EMS), which faces severe capacity challenges. Two channels will replace channels that use the National Medical Channels and bring Boston EMS into compliance with regional standards. A third repeater channel will address the operations and surge challenges the system currently faces. Two other simplex frequencies will be designated as tactical EMS frequencies for use region wide.

To enhance the Boston Area Police Emergency Radio Network (BAPERN) radio network, particularly during major incidents, two additional repeater channels will be created to cover the greater Boston area. These channels will be drawn from the Part 22 UHF frequencies. The channel will aid in daily operations by providing additional talk paths in a heavily congested area, increasing the ability of the region to respond to emergent incidents.

Four UHF channels will be used to build out multi-band channels across the MBHSR region for inter-jurisdictional, inter-discipline communications and will be part of the region wide interoperability network. The four VHF channels of the Chelsea, Everett and Revere Fire Departments will be used to support the interoperability network. Four 800MHz frequencies will be needed to complete this initiative, due to the rebanding of the 800 MHz band, the particular frequencies are not identified. The UHF paging channels will enable a region wide interoperability network that will bridge the VHF, UHF and 800 MHz bands and improve communications capability of individual agencies.

The engineering database used in this application is the best available listing of FCC facilities technical data that could be obtained as of this date. In the event there are errors that are found within this application because the FCC database that has been made available to industry is incomplete or otherwise inaccurate, we request that we be given an opportunity to submit an amendment without prejudice o correct such errors.

Survey of Existing Public Safety Spectrum

The criteria for evaluation follows the FCC rules. A survey of all VHF, UHF, 700,800, and 821 spectrum was conducted using the Washington Radio Reports (WRR) and the FCC Universal Licensing Service (ULS) database as the source for the data. Then, these results were updated on the basis of recent FCC Orders. The results of this survey indicate that there are insufficient available exclusive use channels in the bands surveyed.

Due to the vast amount of data reviewed, only summaries are offered. We can provide electronic copies of the search data if requested. Frequencies searched included the bands from 150 to 160 MHz, 450 to 454 MHz, 460 to 466 MHz, 470 to 473 MHz, 476 to 479 MHz, 806 to 820 MHz, and 821 to 824 MHz, and the results are summarized below:

150 – 160 MHz

A summary of best frequencies found in the search for this band, also documented in APPENDIX A and reveals one available frequency that meets the requirements of MBHSR.

450-454/460-466 MHZ

The summary of best frequencies found in the search for this band, also documented in APPENDIX A, reveals that there are no available frequencies here that meet the requirements of the MBHSR in this band.

470 to 473 MHz and 482 to 485 MHz

The search identifies many 6.25 kHz frequencies that are available. However, there is no manufacturer to date that is producing high power equipment for this narrow bandwidth in this frequency range. In addition, if equipment was available, the likelihood exists that these frequencies could not be coordinated due to the close proximity of existing co-channel users. The few 12.5 kHz channels found fail the TIA8.8 test.

764-776/794-806
New Public Safety Band

This band is in the process of being established by the Commission. The earliest availability projected for this spectrum in the Boston Metro area is the law's mandated date for broadcasters to vacate the spectrum by 2/17/09. The immediate use of this band by the MBHSR is prohibited by the TV stations shown in TABLE 1 that are currently licensed and operating on these newly assigned Public Safety Channels.

TABLE 1
Co and Adj.Channel TV Stations that Prevent MBHSR Use of 764-806MHz
Coordinates used: 42-21-24/4N 71-03-23.2 Geogeapi Center Boston 90.303 (b)

CALL SIGN	CHANNEL	CITY/STATE	DISTANCE TO
WMFP	62	Lawrence, MA	.25
WNAC	64	Providence, RI	57.5
WEDY	65	New Haven, Ct.	118.0
WDMR (LP)	65	Springfield, MA	86.5
WGSAM (LP)	65	Lebanon, NH	109.3
WTMU-LP	67	Boston, MA	2.4
WBPX	68	Boston, MA	2.4
WPXQ	69	Block Island, RI	70.4

806-821/851-866

The findings in the report for the 800 MHz Public Safety Pool shows all channels assigned. There are no land mobile channels available in any of the other services in this band.

821-824/866-869

The MBHSR is located within the boundaries of Region 19. A survey of the National Public Safety Planning Advisory Committee (NPSPAC) shows 18 channels are available in the Metro Boston area. The use of two of these channels for interoperability with agencies operating at 800 MHz is contemplated. These agencies are primarily state agencies. The remaining 14 channels are insufficient to meet the MBHSR requirements.

The above lack of spectrum in the Greater Boston area is further verified by the letter in Appendix B from APCO frequency advisor for Massachusetts & Rhode Island, Mr. James A. Warakois, to Mr. Dave Troup, Jr., Director of Telecommunications, Boston Police Department and BAPERN Representative, MBHSR Interoperability Subcommittee.

Current Frequency Usage in Greater Boston

The majority of all Public Safety Agencies currently operating in the UASI. MBHSR operate at UHF. When this waiver is approved, the three remaining VHF Fire Departments in the cities of Chelsea, Everett and Revere will move to UHF and their existing VHF channels will be converted to inter-operable VHF channels to provide communication links to communicate with responders from areas outside the designated Metro Boston UASI. area. VHF-High Band is used mostly by fire departments north of Boston and some scattered use to the south and west. 800 MHz is in use predominately by agencies of the State of Massachusetts, City of Cambridge and City of Boston (municipal services) non-first responders.

Frequency Usage by Band for Agencies in the MBHSR

Agency	Frequency Band of Primary Use
Boston Police	UHF
Boston Fire	UHF
Boston EMS	UHF
Brookline Police	UHF
Brookline Fire	UHF
Cambridge Police	800MHz
Cambridge Fire	800MHz
Chelsea Police	UHF
Chelsea Fire	VHF will convert to UHF
Everett Police	UHF
Everett Fire	VHF will convert to UHF
Quincy Police	UHF
Quincy Fire	UHF
Revere Police	UHF
Revere Fire	VHF will convert to UHF
Somerville Police	UHF
Somerville Fire	UHF
Winthrop Police	UHF
Winthrop Fire	UHF
Massachusetts Port Authority	800MHz
Massachusetts Bay Transportation Auth.	UHF
Massachusetts State Police	800MHz

Interoperable Systems

There are two intra-discipline mutual aid radio systems in operation in the area known as BAPERN and MetroFire. The BAPERN (Boston Area Police Emergency Radio Network) is sponsored by the Greater Boston Police Council (GBPC) and includes membership from 128 cites and towns stretching from New Hampshire to Rhode Island. This system operates in the UHF band (see figure 1). The MetroFire radio system serves 35 cities and towns and provides inter-agency communications, primarily in the UHF band (see figure 2)

The BAPERN network includes two Area Wide UHF channels which are simulcasted across the entire membership area. There are also five "district" UHF channels which are more localized in geographic scope. In major events, the BAPERN system is in full use; multiple events present severe challenges to the system. The BAPERN system has very little surge capacity.

The MetroFire radio system consists of one wide area UHF channel for intra-department coordination and one wide area UHF channel for fireground communications. The fireground channel is cross-banded to a VHF frequency for interoperability purposes. There is a third channel primarily used in simplex mode for Hazmat operations and it can also be used for a tactical repeater. These three channel pairs along with the individual city and town department channels provide fire communications across a wide region. In addition there is only one channel to enable cross-band communications.

An effective way to increase the level of interoperability is by reducing the number of frequency bands agencies operate in. Within the MBHSR, three fire departments primarily use VHF frequencies, one fire and police department uses a citywide (Cambridge) 800 MHz trunked system, the other 13 first response public safety agencies use UHF frequencies. Cambridge has the ability to allow cross-patching to their 800 MHz system to a dedicated set of UHF frequencies and regional UHF systems. Shifting the three fire departments on VHF to UHF greatly enhances interoperability in the immediate Boston metropolitan area, as all primary agencies will operate within the same frequency band at the subscriber level. What will emerge is an interoperable network that will allow seamless communications within the immediate Boston metropolitan area as well as a bridge to regional areas on the VHF band and to those metro agencies on 800 MHz. Incident commanders will have expanded flexibility to call on a range of resources. The obstruction to making this move happen is the lack of frequencies.

The City of Boston, acting on behalf of the collective jurisdictions constituting the Metro Boston Homeland Security Region, are petitioning to move 34 Channels and 6 frequencies from Part 22 of the Commission's rules to Part 90.

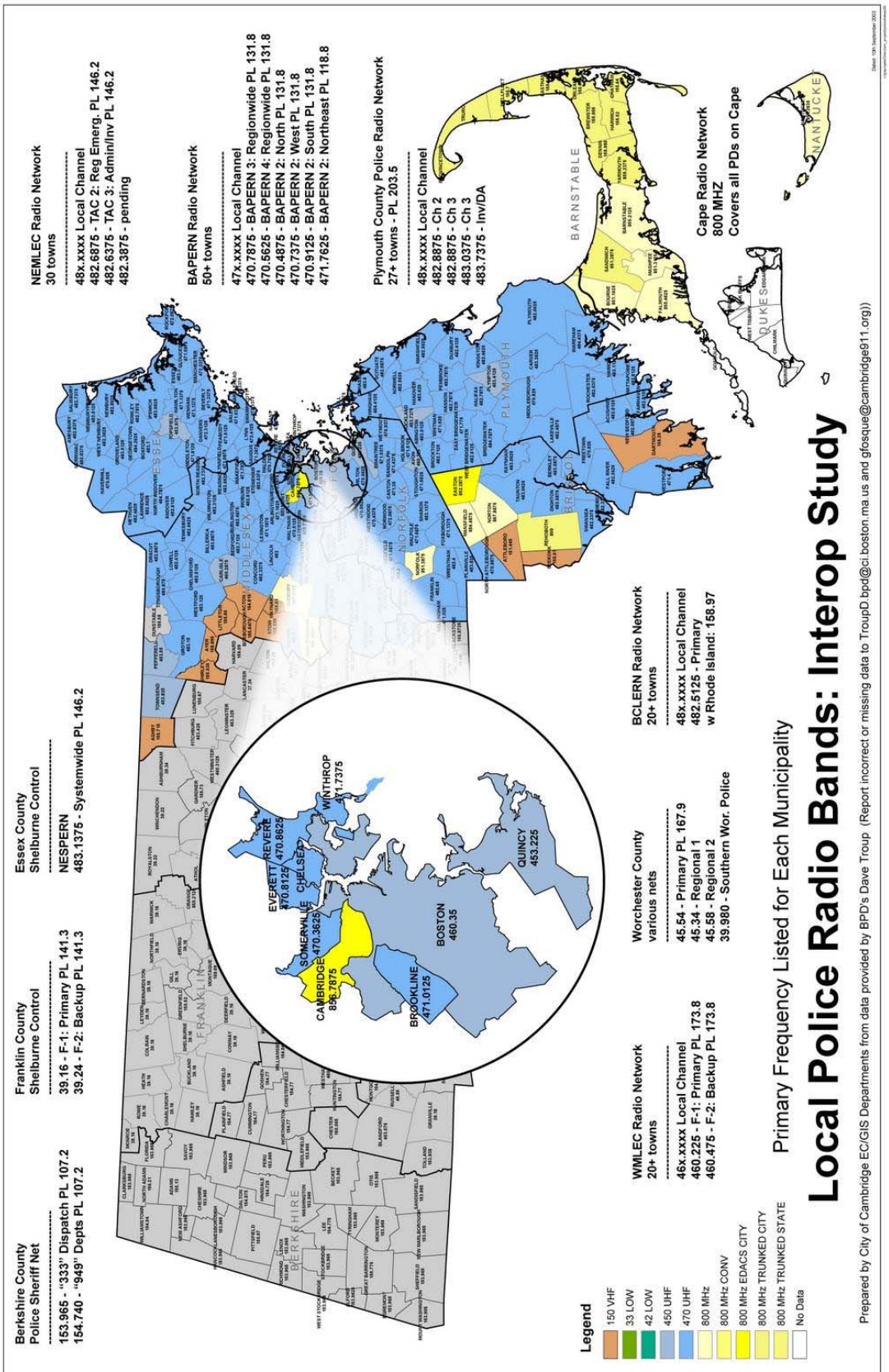
Berkshire County
Police Sheriff Net
153.965 - "333" Dispatch PL 107.2
154.740 - "949" Depts PL 107.2
Franklin County
Shelburne Control
39.16 - F-1: Primary PL 141.3
39.24 - F-2: Backup PL 141.3
Essex County
Shelburne Control
NESPERN
483.1375 - Systemwide PL 146.2
NEMLEC Radio Network
30 towns
48x.xxxx Local Channel
482.6875 - TAC 2: Reg Emerg. PL 146.2
482.6375 - TAC 3: Admin/Inv PL 146.2
482.3875 - pending
BAPERN Radio Network
50+ towns
47x.xxxx Local Channel
470.7875 - BAPERN 3: Regionwide PL 131.8
470.5625 - BAPERN 4: Regionwide PL 131.8
470.4875 - BAPERN 2: North PL 131.8
470.7375 - BAPERN 2: West PL 131.8
470.9125 - BAPERN 2: South PL 131.8
471.7625 - BAPERN 2: Northeast PL 118.8
Plymouth County Police Radio Network
27+ towns - PL 203.5
48x.xxxx Local Channel
482.8875 - Ch 2
482.8875 - Ch 3
483.0375 - Ch 3
483.7375 - inv/DA
Cape Radio Network
800 MHZ
Covers all PDs on Cape
WMLEC Radio Network
20+ towns
46x.xxxx Local Channel
460.225 - F-1: Primary PL 173.8
460.475 - F-2: Backup PL 173.8
Worchester County
various nets
45.54 - Primary PL 167.9
45.34 - Regional 1
45.58 - Regional 2
39.980 - Southern Wor. Police
BCLERN Radio Network
20+ towns
48x.xxxx Local Channel
482.5125 - Primary
w Rhode Island: 158.97
Primary Frequency Listed for Each Municipality
Local Police Radio Bands: Interop Study
Legend
150 VHF
33 LOW
42 LOW
450 UHF
470 UHF
800 MHz
800 MHz CONV
800 MHz EDACS CITY
800 MHz TRUNKED CITY
800 MHz TRUNKED STATE
No Data
EVERETT / REVERE
470.8125 / 470.8625
CHELSEA
WINTHROP
471.7375
SOMERVILLE
CAMBRIDGE
470.3625
856.7875
BOSTON
460.35
BROOKLINE
471.0125
QUINCY
453.225
BERKSHIRE
FRANKLIN
ESSEX
MIDDLESEX
NORFOLK
BRISTOL
PLYMOUTH
BARNSTABLE
DUKES
NANTUCKET
Prepared by City of Cambridge EC/GIS Departments from data provided by BPD's Dave Troup (Report incorrect or missing data to TroupD.bpd@ci.boston.ma.us and gfosque@cambridge911.org))

Figure 1

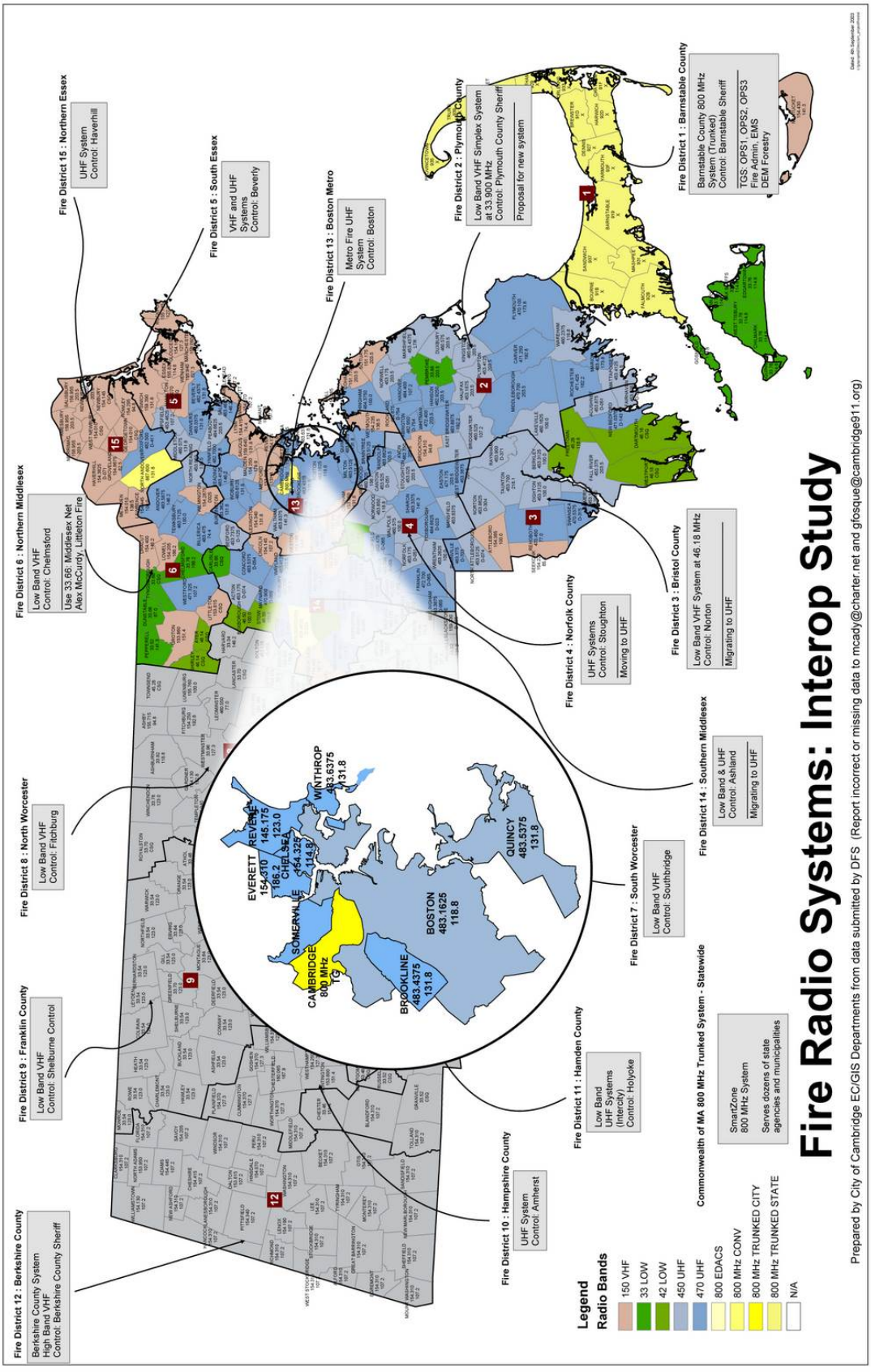
Fire Radio Systems: Interop Study
Prepared by City of Cambridge EC/GIS Departments from data submitted by DFS (Report incorrect or missing data to mcady@charter.net and gfosque@cambridge911.org)
Legend
Radio Bands
150 VHF
33 LOW
42 LOW
450 UHF
470 UHF
800 EDACS
800 MHz CONV
800 MHz TRUNKED CITY
800 MHz TRUNKED STATE
N/A
Commonwealth of MA 800 MHz Trunked System - Statewide
SmartZone
800 MHz System
Serves dozens of state agencies and municipalities
Fire District 12 : Berkshire County
Berkshire County System
High Band VHF
Control: Berkshire County Sheriff
Fire District 9 : Franklin County
Low Band VHF
Control: Shelburne Control
Fire District 8 : North Worcester
Low Band VHF
Control: Fitchburg
Fire District 6 : Northern Middlesex
Low Band VHF
Control: Chelmsford
Use 33.68: Middlesex Net
Alex McCurdy: Littleton Fire
Fire District 15 : Northern Essex
UHF System
Control: Haverhill
Fire District 5 : South Essex
VHF and UHF
Systems
Control: Beverly
Fire District 13 : Boston Metro
Metro Fire UHF
System
Control: Boston
Fire District 2 : Plymouth County
Low Band VHF Simplex System
at 33.900 MHz
Control: Plymouth County Sheriff
Proposal for new system
Fire District 1 : Barnstable County
Barnstable County 800 MHz
System (Trunked)
Control: Barnstable Sheriff
TGS: OPS1, OPS2, OPS3
Fire Admin, EMS
DEM Forestry
Fire District 4 : Norfolk County
UHF Systems
Control: Stoughton
Moving to UHF
Fire District 3 : Bristol County
Low Band VHF System at 46.18 MHz
Control: Norton
Migrating to UHF
Fire District 14 : Southern Middlesex
Low Band & UHF
Control: Ashland
Migrating to UHF
Fire District 7 : South Worcester
Low Band VHF
Control: Southbridge
Fire District 11 : Hamden County
Low Band
UHF Systems
(Intercity)
Control: Holyoke
Fire District 10 : Hampshire County
UHF System
Control: Amherst
EVERETT
154.430
186.2
CHELSEA
454.325
114.8
REVERE
145.175
123.0
WINTHROP
483.6375
131.8
SOMERVILLE
CAMBRIDGE
800 MHz
TG
BROOKLINE
483.4375
131.8
BOSTON
483.1625
118.8
QUINCY
483.5375
131.8

Figure 2

FCC Part 22 Frequencies Available

FCC rules in 47 CFR Part 22 Paging and Radiotelephone Service, Subpart E Section 22.621 state: "The following channels are allocated for assignment to transmitters utilized within point-to-multipoint systems that support transmitters that provide public mobile service." The list of frequencies include a set for sharing in the UHF TV band channels 14 and 16 in the Boston area which are included in TABLE 2. A search of the FCC Licensed database, updated by recent Orders, and shows that there are 75 frequencies 12 ½ KHz. wide between 470/473-482/485 MHz that are not licensed for any use as point to multipoint services in the Boston area. Based on Section 337 (c) of the Communications Act, 72 of these frequencies may be paired to provide 34 channel pairs for use by the MBHSR, while the remaining 6 frequencies can serve as Fire Ground or other simplex channel operations. These frequencies are listed in TABLE 3 which follows.

TABLE 2
47CFR 22.621
Paging and Radiotelephone on Channel 14 and 16

25kHz. frequencies

1.	470.0125	473. 0125	482. 0125	485. 0125
2.	470. 0375	473. 0375	482. 0375	485. 0375
3.	470. 0625	473. 0625	482. 0625	485. 0625
4.	470. 0875	473. 0875	482. 0875	485. 0875
5.	470. 1125	473. 1125	482. 1125	485. 1125
6.	470. 1375	473. 1375	482. 1375	485. 1375
7.	470. 1625	473. 1625	482. 1625	485. 1625
8.	470.1875	473. 1875	482. 1875	485. 1875
9.	470. 2125	473. 2125	482. 2125	485. 2125
10.	470. 2375	473. 2375	482. 2375	485. 2375
11.	470. 2625	473. 2625	482. 2625	485. 2625
12.	470. 2875	473. 2875	482. 2875	485. 2875

TABLE 3
UHF Channel 14 and 16 Frequencies
Channels will be 12.5 kHz wide

Channel Number	Base Xmit	Base Rcve
1	470.0125	473.0125
2	470.0250	473.0250
3	470.0375	473.0375
4	470. 0500*	473. 0500*
5	470.0625	473.0625
6	470.0750	473.0750
7	470.0875	473.0875
8	470.1125	473.1125
9	470.1250	473.1250
10	470.1375	473.1375
11	470.1500	473.1500
12	470.1625	473.1625
13	470.1750	473.1750
14	470.1875	473.1875
15	470.2000	473.2000
16	482.0125	485.0125
17	482.0250	485.0250
18	482.0375	485.0375
19	482.0500	485.0500
20	482.0625	485.0625
21	482.0750	485.0750
22	482.0875	485.0875
23	482.1375	485.1375
24	485.1500	485.1500
25	482.1625	485.1625
26	482.1750	485. 1750
27	482.1875	485.1875
28	482.2000	485.2000
29	482.2125	485.2125
30	482.2250	485.2250
31	482.2375	485.2375
32	482.2500	485.2500
33	482.2625	485.2625
34	482.2750*	485.2750*
35	482.2875	485.2875
36	482.3000	485.3000
37	485.1000*	
38	485.1250*	

Note * denotes the frequency as simplex

Land Mobile/TV Channel Shared Band Availability

FCC rules in 47 CFR Part 90, Subpart L, Section 90.309, set forth the limitation on land mobile transmitter maximum Effective Radiated Power (ERP), height, and geographic location for operation in the TV sharing band, also called the "T band." The maximum power and height allowed for land mobile base stations is 1000 watts erp at 152.5 m (500 feet) in this band. The tables and graphs provide for a minimum separation between the TV transmitter and the land mobile base site as a function of the ERP and height of the land mobile base antenna. Co-channel operation in the Boston Metropolitan area requires that TV channel 14 and 16 receivers be provided 50 dB of protection as shown in Section 90.309. There is also an adjacent channel requirement for both channels. The spacing that permits the maximum ERP and antenna height for channels 14 and 16 and for adjacent channels are 260 km (162 mi.) and 108 km (67 mi.) respectively.

The FCC maintains a database of all TV stations in the US and border areas of Canada and Mexico from which their location can be obtained. All Channel 14, 15 16 and 17 stations in the states of Connecticut, Massachusetts, New York , Maine, New Hampshire, Vermont and Rhode Island were investigated. The great circle spacing from the Greater Boston Metropolitan area to all of the TV transmitters meet the co-channel and adjacent-channel full spacing requirement.

Potential Land Mobile Interference Analysis

We have reviewed the selected channels covered under this waiver request and have determined there are no co-channels Part 22 or Part 90 users licensed on the selected Channels. We have reviewed the adjacent channels and have determined that there are either none or where there are identified Licensees on the adjacent channel, they are operating narrow band (12.5KHz) similar to our applications and there will be no overlapping band widths. There are no adjacent wide band (25KHz.) users to our selected frequencies.

Conclusion

Based on public information, we have shown that there are insufficient wide area VHF or UHF channels available for land mobile use in the area served by MBHSR. There are thirty four UHF channel pairs that are each 12 ½ by 12 ½ kHz, plus six 12 ½ kHz simplex channels have been identified that are listed in FCC Rules Part 22 that are not presently licensed to any user for Point to Multipoint operation. Use of these channels by the MBHSR in the Greater Boston area for public safety communications is technically feasible and will not cause harm to other spectrum users entitled to protection from interference in these bands. These frequencies should therefore be licensed to the MBHSR in the Greater Boston area for public safety use.

APPENDIX A

FREQ	STATUS	FCC INFORMATION
150.9800	AVAILABLE	Base or Mobile - Oil spill containment use
151.5050	AVAILABLE	Base or Mobile - Itinerant use only
151.6400	AVAILABLE	Base or Mobile - Itinerant use only - max bandwidth = 6 kHz
151.7000	AVAILABLE	Base or Mobile - max bandwidth = 11.2 kHz - max power = 35 watts
151.8200	AVAILABLE	Mobile only - Itinerant use - max power 1 watt - bandwidth = 11.25 kHz
151.8800	AVAILABLE	Mobile only - Itinerant use - max power 1 watt - bandwidth = 11.25 kHz
151.9400	AVAILABLE	Mobile only - Itinerant use - max power 1 watt - bandwidth = 11.25 kHz
154.5550	AVAILABLE	Base or Mobile -max bandwidth = 6 kHz
154.6100	AVAILABLE	Base or Mobile -max bandwidth = 6 kHz
154.6400	AVAILABLE	Base only - max bandwidth = 11.25 kHz - one way aging - max power = 20 watts
154.9200	AVAILABLE	Base or Mobile - Assigned to State Police only
158.4000	AVAILABLE	Base or Mobile - Itinerant use
159.2250	AVAILABLE	Base or Mobile
159.4800	AVAILABLE	Base or Mobile - Oil spill containment use
160.2150	AVAILABLE	Base or Mobile - Railroad use only

NOTE: NONE OF THE 7.5 kHz FREQUENCIES ARE INCLUDED (due to overlapping adj. channels)

FREQ	STATUS	FCC INFORMATION
452.9125	AVAILABLE	Base or Mobile - Maximum bandwidth allowed = 11.25 kHz - Railroad is Primary
452.9250	AVAILABLE	Base or Mobile - railroad only
452.9375	AVAILABLE	Base or Mobile - Maximum bandwidth allowed = 11.25 kHz - Railroad only
452.9500	AVAILABLE	Base or Mobile - railroad only
460.2625	AVAILABLE	Base or Mobile - Maximum bandwidth allowed = 11.25 kHz

APPENDIX B

APCO International
351 N. Williamson Blvd.
South Daytona, FL 32114-1112
Fax (904) 322-2501
E-mail afc@apco911.org
AFC *Automated frequency coordination*

Jim Warakois
Frequency advisor:
Massachusetts
Rhode Island
617 343-4214 (v)
617 325-2352 (f)
Email :
koisj@rcn.com

September 8, 2006

Mr. H. David Troup, Jr.
Director of Telecommunications
City of Boston, Police Department
400 Frontage Rd.
Boston, MA 02118

Dear Mr. Troup:

At the request of the UASI Consultant Mr. Emil Vogel, I have conducted frequency spectrum search in the VHF, UHF and UHF TV shared frequencies 470 / 482 MHz T bands. I understand there is a need for additional communications channels for UASI member agencies, as well as interoperability use between agencies.

Specific attention was addressed to the TV shared frequencies in 470 / 512 MHz band that is the spectrum allocation presently utilized by BAPERN and NEMLEC public safety groups.

I have concluded that the most severe congestion and interference exists within a 50 mile (80km) radius of the Boston Urban area. Frequencies in all assigned channels are highly congested and there are now no open channels. The conclusion also applies the 12.5 interstitial channels, where inter-system protection must be maintained between a 12.5 KHz. System and existing 25KHz system separated by 12.5 kHz.

Therefore; as the APCO Frequency Advisor for Massachusetts it is my final judgment that none of the spectrum search lists show additional radio channels which could be allocated to public safety agencies in the geographic area. In addition, no frequencies are immediately available to satisfy the requested Boston UASI public safety needs.

Sincerely:

James A. Warakois, AE, BSE
APCO Frequency Advisor, MA / RI

Cc: Emil Vogel, Vogel Consulting Group Inc.